

# **OSAKA**

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## TWO CONSUMPTION FUNCTIONS; STATIC AND DYNAMIC

YASUMA TAKATA

### I *Two Consumption Functions*

Consumption function is believed to be the pivot of Keynesian economics, especially in his theory of the future picture of the capitalistic economy. According to the general organizational structure of his consumption function, the rate of consumption decreases more and more in the process of economic development, therefore in the incessant course of the increase in national income so that the difficulty to invest savings will become greater and greater. But the thesis may not be maintained because the consumption function out of which the future rate of consumption is accounted is not a function of the future but the present one which is supposed to prevail in the future also: that is the static consumption which shows the income-consumption relation at a time, for example at present and which may not extend to the future. A consumption function which tells the income-consumption ratios corresponding to different quantities of income at successive times may be named the historical or dynamic consumption function and this only will permit the prediction of the future rates of consumption. From such a point of view one may say that Keynesian economics modified and transformed the static consumption function into a dynamic consumption function without sufficient reason.

Thus the stagnation thesis, which the post-Keynesian insists upon so strongly, is deprived of its theoretical basis since it is deduced from unproved dynamic consumption function. If we wish to prove this thesis we have to presuppose the dynamic consumption function in such

a form as Kuznets' data of savings would justify; indeed that data give no support to the stagnation thesis of this sort as we know.

To reconcile the ordinary, static consumption function and the Kuznets' data of savings is a task of great importance in the present state of economics study. This has been achieved by introducing the idea of succeeding shifts of static consumption curve occurring during the long process of economic development, and of income-increasing. During the secular process of the increases in income, the consumption curve shifts upwards so that the average rate of consumption are maintained, on the same level so that the average savings rate remains unchanged, at least, showing no secular trend though it fluctuates with cycles, as was clearly analyzed by Prof. Hansen and others. Of course it is difficult to demonstrate why the average rate must necessarily remains unchanged, and at 10 per cent, but the reason why it should be unchanged through a long period is not explained there and at present we must be satisfied with such a rough sketch as this.

## II. *The Task of Interpretation*

The next task seems to be the interpretation of the very fact of the rising shift of consumption-rates, to say with other words, the successive change of static consumption curves.

To accomplish this task means to give the explanation of the secular rise in the level of living. The theory of the static consumption function tells that the level of consumption is stable at any level of income, but the historical fact disproves this, and shows that the corresponding amount of consumption for any level of income increases successively paralleling economic development. In the modern capitalistic world, there exists an universal tendency of the incessant increase in demands for material goods.

Through what process and by which motive does the demand increase? I will answer this very plainly and frankly with what I have held to over the years.

Before preceding further it will convenient to discourse upon "desire for power", "will to power" (or "power will"). Social power

or power in short means here the ability or capacity to move others' will in the direction which he wishes, so that power is nothing else than the capacity to make others obey; and the social power in such an abstract sense is incorporated into a few concrete forms. (A) direct power or power in the narrow sense, i. e., power secured by force, actually or potentially, meaning coercion, (B) indirect power or wealth referring to the possibility to make others obey through giving, (C) prestige or any symbol, which suggests a part of immense and hidden power, making others obey spontaneously moved from within, consequently without use of any sanction. In the actual world of general emulation, one seeks to acquire such social powers as much as possible and to show, at the same time the powers already acquired, because to show them means to acquire new power which is the secret of the mechanism of the raising of the standard of living.

To acquire and to show are the both sides of the will to power which sustains all social stratification. In this case we are concerned with the showing side of the will to power. All have an innate tendency to display social powers which they acquired. If we use the term "vanity" we can call this the desire of vanity. It penetrates into and determines all our economic, life, and especially that of consumption. Economic goods are preferred and demanded according (a) to the degree of the intrinsic quality or the proper utility irrespective of the attitudes of others, consequently according to the rank or position in quality and (b) to the extent to which the utility in "showing" and "being shown" is satisfied. When we neglect the latter element and suppose that the choice is determined only by the satisfaction in the qualities of commodities then our total demand will be determined independently by individuals so that social demand is the mere sum of the individual demands and this represents the common standpoint of classical theorists.

When we take into consideration the element of showing and of being shown, the situation will change. Social demand is not the mere

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This division of powers into three originate to James Mill, and is seen also in the works of many sociologists, as Gabriel Tarde and others. The scientific analysis of prestige is very difficult but interesting and fascinating.

sum of individual demands which are spontaneously and independently determined without being influenced by the intermental or mutual actions. The postulate of independence must be rejected. Likely considered, when we neglect the showing element in demand, we attain to the principle of reversibility meaning that the level of consumption will decrease to the old scale, if the income falls down to the former level, because the demand situation will be determined only by actual values without being influenced by mutual showing.

Considered from this point there seems to be two ways of explanation of the long process of the development of human material demand. A starting point: man prefers goods of higher quality than of lower quality, the quality meaning the degree of satisfaction or the intrinsic capacity to give satisfaction. When we acknowledge the prevalence of such human propensities, the demands for higher qualities will incessantly increase so that the standard of living rises automatically. On one side, there will prevail a system of hierarchy of commodities in which the positions are determined by their respective qualities; on the other side all economic subjects are seeking highquality-commodities so far as income increases to make it possible. Then the necessary consequence must be the ceaseless development of social demands. If we take into consideration some social factors as self-esteem, ego ideal, social goal, the role of them must be seen as secondary, at most supplementary, the importance being rather trifling.

Contrary to this view, if we accentuate the importance of social, especially of displaying side, our measures of reasoning change completely. The reason why we choose this way of thinking, are as follows.

(1) Historical: The original propensity to climb the ladder of commodity quality must be disproved by the historical and ethnological facts. There were and are many examples of the peoples in the backward countires whose custom of living has not sppreciably changed in spite of the lengthy contact with European culture and commodities.

Usually there prevail among them the conservative traditions which strictly prohibit and evade new things. The lower the level of culture, the stronger are the efforts to suppress new ways of living.

(2) Theoretical: That the higher quality of commodities is always in the rational direction is untenable. Within one way of use, commodity is of higher quality than A. But a commodity has many sides of use so that A as a bundle of use is of higher quality than B as another bundle of use. To make comparison among commodities of immense number of sorts must be impossible especially from the point of their intrinsic nature. Moreover what are meant by high quality is the more preferred, and by more preferred we can see that it is more paid, consequently 'high price'. This is the general series of every day thinking. Therefore to say that we seek a commodity of higher quality means nothing else than that we seek a commodity of higher price. This leads to the conclusion that to say that we pay more money, seeking higher-quality-commodity is synonymous with that we think it of higher quality commodity because we pay more money for it.

The natural conclusion from the above premise must be that the raising of the level of consumption can not be realised by the successive seeking of the commodities of higher qualities because it presupposes the propensity to climb up to higher qualities, the existence of which can not be ascertained.

### III *Power Display*

What then is the process of raising the level of consumption? This can be explained not by the intrinsic quality of commodities but by the social factors, by the mechanism of power-display.

The raising of consumption always means the expansion of expenditures and this expansion is nothing else than paying more which is necessary in demanding new quality and quantity of commodities. Since in this case new quantity can be analyzed as if it is a type of quality from the view point of desires, the consideration must be concentrated on the new quality of commodities. A new demand, that is demand for new commodity is created always in a upper class and then flows down to the lower by imitation making the cataract of contagion as a new luxury which is fated to become a kind of necessities develops after it propagated among the lowest strata. That

demand springs up on the high position as a symptom or symbol of powers (wealth, political powers, other influences), then flows downwards by superity-imitation of the middle and lower strata who seeks to appear and wish to be seen as if they were belonging to the upper strata. Created for power-display, it is imitated also for power-display. When A commodity becomes no longer peculiar by propagation and accomodation, then B and C grow successively with the same fate to the result that there are incessant accumulations of new demands and new commodities. The same psychology, which creates "conspicuous consumption" as a peculiarities of capitalist class, prevails widely through all strata of society.

This way of thinking does not neglect the role of quality in the demand expansion process. The demands for durable consumption goods are increasing in present day Japan also. To cite electrical washing machine as an example, it is convenient to use; it is high in its intrinsic quality. But when it is purchased as a part of dowry of a farmer's family, it is demanded without sufficient knowledge of its uses consequently as a new symbol of expensive living, not neccessarily owing to its quality. When the income of any one increases, part of it is used to buy new articles. Of course he makes preference but the considered utilities are of two kinds, (a) the intrinsic utility, which is derived from the intrinsic quality (b) the utility, indisplay which is external to it. Two kinds of utilities cooperate in the action of preference. And when it seems as if preference is made only along the line of intrinsic utility, actually the selection of direction is made from many possibilities which serve for the purpose of display. Without thinking so, a wide range of luxury expenditures, which constituts the major part of high level of living, is beyond explanation: for example, the expenditure for clothes is chiefly used to follow the fashions which are formed determined by the intrinsic quality of articles in the smallest extent.

#### IV. *Interpretation of Prof. Duesenberry's Thesis*

The opinion above explained is not new, for it is a mere synthesis

of some precursor's theories, such as Gabriel Tarde, Thorstein Veblen, Georg Simmel and especially Gurewitch. I wrote it as early as in 1920 in my work "Principles of Sociology" (in Japanese) and since then I criticised often the economic policies of successive Government standing on this view. When I read Keynes' General Theory on the spring 1936, I met with the difficulty in understanding his visoin of capitalism, the deep cause lying in my concept of demand development.

Last summer I had an opportunity of reading P. Duesenbery's work and learned his thesis on the reconciliation of two consumption functions and the revision of two postulates, of independence and of reversibility, which I accept in principle and I am inclined to conclude that the stagnation theory of Keynesian school has lost it's solid basis. But on the interpretation of the actual process of the development of demands, of the raising of the standard of living, that is social dynamics of demand, I cannot help but retain some difference of opinion though his sound insight and penetrating idea have deeply impressed me.

Now I wish here to recapitulate his theory of consumption.

(1) There are a definite order in superior and inferior relations among all consumptive goods. That is to say, every goods has a relative position in quality. The consumer prefers always the higher quality goods to the lower quality goods if income permits.

(2) To know and believe the existence of A (a higher quality commodity is sufficient condition to make the consumer entertain the demand for A. On this point the author seems to permit different interpretations at first sight; to know the higher quality goods is a necessary condition, to contact with it repeatedly provides a sufficient condition to make demand for them. But to know and to contact with are not different matters for us.

"The family knows of the existence of higher quality goods and would prefer them to the ones now in use. But it could only attain these by giving up saving."<sup>1)</sup> "People believe that the consumption of high quality goods for any purpose is desirable and important". "But

1) Desembery, Income, Saving and the Theory of Consumer Behavior, p. 26.

mere knowledge of the existence of superior goods is not a very effective habit breaker. Frequent contact may be.”<sup>2)</sup>

This means that mere knowledge may be weak or a potential habit breaker. Only the contact is an effective; but what is to make contact with? It must be nothing else than to know repeatedly and vividly, it is intensive knowing, so the author concludes. “So far it has been assumed that impulses to increase expenditure arise only out of a belief in the superiority of certain goods for fulfilling some need.”<sup>3)</sup>

In short, knowledge or belief acts as an impulse to increase expenditure or to demand higher quality goods. Contact with them makes the impulse stronger so that it may be realised.

Then comes the function of social factor. According to the author, there is another aspect of consumption which is equally important.

(a) In our time, the attainment of a higher standard of living is a principal goal so that the desire to get superior goods takes on a life of its own.<sup>4)</sup>

(b) “In a society in which improvement in the living standard is a social goal, the drive for maintenance of self-esteem will become a drive to get higher quality goods.”<sup>5)</sup>

(c) “The possibility of social mobility” “converts the drive for self-esteem into a desire for high social status. But since high social status requires the maintenance of a high consumption standard, the drive is again converted into a drive to obtain high quality goods.”<sup>6)</sup>

These propositions in three parts tell us that.

(a) “Higher living” is a principal goal.

(b) Self-esteem (the drive for maintenance of self-esteem) becomes the drive to get high quality goods.

(c) Social mobility transforms the drive of self-esteem into a drive for high quality goods (through the status) theory. If my interpretation is correct, Prof. Duesenberry's thinking on the development of

2) *ibid.*, p. 27.

3) *ibid.*, p. 23.

4) *ibid.*, p. 25.

5) *ibid.*, p. 29.

6) *ibid.*, p. 31.

consumption consists of two aspects. One is the fundamental side, other the additional side. The former is an interpretation by rational factors, the latter the one by irrational factor. The so called demonstration effect is thought to belong to the sphere of rational, "conspicuous consumption" to the sphere of irrational. So interpreted, it seems to me, that the theory contained in itself too many or too exuberant premises<sup>7).</sup>

First of all, the universal appreciation scale of qualities of every goods, which may be grasped by any one, is presupposed. When some of them are enjoyed, man wishes to enjoy the next goods of higher quality. All economic subjects have the innate tendency to climb the ladder to the high goal of consumption. Man as such is an automatic quality seeker. Without two supposition, the universal scale of qualities in the world of goods and the innate tendency of seeking higher quality goods, this theory can not be understood. On the universal scale of qualities of consumptive goods I have argued above. To presuppose such innate tendencies, it will mean a kind of circular reasoning, like the instinct of exchange in the theory rendered by Adam Smith. What must be explained is projected forward into the tendency. In the realm of fashions and ordinary luxuries, colour tones or "who wear it" or high price are of the first importance: of course we can not neglect the quality in convenience but the comparative quality in one aspect is but a mere partial determining, factor in the direction of expenditure.

So far as to the rational aspect. As to the irrational side we are given two factors. The higher standard of living as a social goal and the maintenance of self-esteem. But the former means to be a ring in circular reasoning. Its role is very similar to innate tendency for higher quality goods in the rational side of the theory. What must be explained is already cast into explicative factor. I think this must be itself explained by other factor, most probably by self-esteem. This last factor enumerated as additional by the auther is most fundamental and of primary importance. It seems to be the same content which

7) We are induced to think (b) and (c) are the methods of actions of the drive for self-esteem, one being direct, the other indirect, which make aspire for higher living.

we means to express as the will to power, though the expression self-esteem shows a rather static, self-regarding state, while the will to power or power will shows dynamic, functioning and active aspect.

Thus conceived the monistic and unified explanation may be given to the development of consumption or of the level of consumption.

Duesenberry's theory stand on the four premises (1) scale of qualities of goods, (2) the innate tendency of higher consumption, (3) social goal of high living, (4) self-esteem. (3) is a mere effect of or derivation from (4). (1) and (2) constitute the fundamental part of his theory, which seems to be too much intellectualistic. (2) will be rejected by ethnologists and sociologists who believe the conservative mentality of primitive people, or of lower culture and I have criticized above (1).

The most important difficulty lies in the fact that theory can tell nothing about the creation or formation of new consumption demands. This is the proper field which may be explained by the functioning of power will. Take the propagation of television as a nearly experienced example. Its high price fails to check the wide contagion, because the upper income classes wish to show their position by paying so much. Higher standard of living is composed from such new or traditional high grade consumption goods as were created at some time as a means for conspicuous consumption. The theory which starts from power-will, when contrasted with Prof. Duesenberry's theory, mean to start from (4) that is self-esteem, and explain the successive appearance and cumulation of new consumption demands. The respective prices of the goods, which satisfy these demands, will be determined by the productive situation, from which the socalled scale of qualities is conceived to exist. Two theories are consequently very close in their insights but in their logical form of premise and conclusion seems to be in reverse.

# ECONOMIC AND SOCIAL DEVELOPMENT OF OSAKA

MATAJI MIYAMOTO

## I

*Osaka*, a city of money-makers is too absorbed in the things of the present and the prospects of the immediate future to look back upon its past.

Yet it is one of the nation's most ancient cities occupying an honorable place in the archaic Japanese national records. The city of *Osaka* appears very early in the ancient Japanese records as being the place where the first Emperor Jimmu landed on his expedition to subjugate the islands of Japan. It is said that as his boats entered the present *Osaka* Bay and approached the mouth of the river now known as *Yodogawa*, they encountered such a high sea that he called the place "Namihana" (*wave flowers*), a name subsequently abbreviated to *Naniwa-tsu* (*tsu* meaning harbour.)

*Ojin*, the 15th sovereign ruler, built a palace at *Naniwa* called *Osumi-no-miya* in the fourth century, while the next Emperor, *Nintoku*, made *Naniwa* his capital, *Osaka* castle approximately marking the site of his *Takatsu* palace.

Three centuries later, *Naniwa* again became the capital of the empire during the reign of the 36th Emperor, *Kōtoku* (645–654), who built there a palace known in history as *Nagara-no-Toyosakino-miya*. The *Taika* Reform (in 646) was done in this capital. In this Reform, the private ownership of land and people was prohibited, and they were put under the direct control of the State. By this Reform the administrative organisation, which was formerly based on the *Shizoku* system (clan system), was changed into the *Gunken* system (prefectural system).

Also *Osaka* was one of the most ancient harbours in Japan. From about the third Century *Naniwa* served as a port through which learning, religion and craftsmanship entered Japan from foreign countries.

Situated at the eastern end of the Inland Sea and *Osaka* Bay and

at the mouth of the River *Yodo* with its rich hinterland, *Osaka* formed a natural harbour for merchant men not only from western provinces of Japan but also from China, Korea and other foreign countries. It is through Osaka Harbour that Buddhism was introduced into Japan in 552 A. D.. It became the channel for a new civilization from the Continent, and a record indicates that a reception hall called "Korokan" was built in the city for the purpose of entertaining foreign envoys. The importance of this city as a cultural center is illustrated by the fact that Prince *Shotoku* chose it as the site for the first public Buddhist temple *Tennoji* to be erected in Japan in the latter part of the sixth Century. The original *Shitennoji* in *Osaka* was one of the oldest temples ever built in Japan and preceded by 68 years the famous *Horyuji* near *Nara*, the oldest existing wooden building in the world built about 1350 years ago. With the establishment of the capital at *Kyoto* in A. D. 794, however, the fortunes of *Naniwa* rapidly waned, until the city ultimately deteriorated into almost a wilderness owing its significance only to the presence of *Tennoji* Temple. For some 1000 years, *Osaka* saw many ups and downs. The next outstanding period for *Osaka* was during the final years of the long civil strife in the mediaeval age.

## II

The name "Osaka" first appears in history at the close of the 15th Century, when the abbot of *Honganji* Temple in *Kyoto* built a cloister somewhere in the vicinity of the present *Osaka* Castle. In 1532 the headquarters of *Honganji* was moved to this site, and around the new temple, known, as *Ishiyama Honganji*, there grew up a sizable town with an ever-increasing population. The temple itself developed into a sort of miniature city, whose precincts were said to contain 6,000 houses and with its host of soldier-priests, it later proved a powerful factor in feudal warfare.

*Osaka's* more recent history dates from 1583-5. In that period, *Hideyoshi Toyotomi*, the conqueror, built here his political capital. Having brought the whole of Japan under his sway in a series of successful campaigns against feuding warlords, this great general and

statesman then set about consolidating his supremacy and making preparations for overseas conquest. With the former purpose in mind, he built the tremendous Castle of *Osaka*, the dimensions of which are still a wonder, though only a vestige of its past glory now remains. He especially chose this site, for it had proved its worth as a defensive position about 50 years earlier when the castle built there by the monks of *Honganji* Temple had defied the repeated assaults of his predecessor, *Nobunaga Oda* for more than a decade. As a base of operations for overseas campaigns, *Osaka* presented the ideal location both geographically and economically. The city was a receiving and distributing center of rice and other products for the whole country and the shrewd *Hideyoshi* fully appreciated the facilities it offered for equipping an army at a moment's notice. Although *Hideyoshi* died without realizing his military ambitions beyond sending two more or less successful expeditions to *Korea*, the stimulus he imparted firmly established *Osaka* as the economic center of the Nation. The present *Osaka* owes much to this great warrior-statesman. It was under his leadership that *Osaka* grew to be a great commercial city and started to assert its position as Japan's foremost commercial and industrial city in the modern sense.

The following year, *Osaka* became the scene of a tremendous struggle. *Hideyoshi* died in 1598 at the age of 63, having his young heir to the tender mercies of his generals, including *Ieyasu Tokugawa*.

In 1602 *Ieyasu* became the virtual ruler of Japan and established his political headquarters in *Edo* (now Tokyo). Eventually, he contrived to quarrel with *Hideyoshi*'s heir, attacked him twice (1614-1615) at the *Osaka* Castle and defeated him. *Ieyasu* was now the undisputed and unchallenged ruler of the country, and solidified the foundation of the *Tokugawa* shogunate regime, which was perpetuated for over 250 years until 1867.

The battle of 1614-5 laid *Osaka* waste, but *Ieyasu* rebuilt it in no time. After the fall of *Osaka* Castle, the *Tokugawa* Shogunate appointed as governor of *Osaka* a man by the name of *Matsudaira Tadaaki*, who undertook a large-scale program of city planning, filling in the outer moats of the castle to make way for a growing population and digging

some of the many canals, such as *Kyomachi-bori* and *Edobori*, which have earned the city the name of the "Venice of Japan." His immediate successors continued the good work and by the late 18th century the population of *Osaka* had reached 407,000 as compared with 268,760 in 1665, according to the oldest population record available. In the ensuing *Tokugawa* era *Osaka* enjoyed some 270 years of peace and prosperity.

### III

The prosperity of the *Osaka* merchants can be traced to the fact that the feudal lords and their retainers received their stipends in the form of rice, which had to be sent to *Osaka* for sale and conversion into hard currency. Thus the feudal lords maintained rice-depositories called "*Kurayashiki*" in *Osaka* and used the local merchants as the medium through which they disposed of their stocks of this cereal. It became known as the commissariat of Japan where all the feudal lords had their warehouses to store and market their provincial produce. Moreover, since *Edo*, the seat of the *Tokugawa* government and a city second only in size to contemporary London, was largely populated by members of the consumer class, governments officials, hereditary retainers of the *Takugawa*, regime the families and retainers of the provincial lords who were obliged to maintain residences there, it had to rely on *Osaka* for the supply of most of its commodities. And then there were many large wholesale marts of essential commodities—vegetables, cereals, lumber, etc.. The majority of the feudal lords found it to their advantage to build storehouses in *Osaka* and shipped the products of their domains to be sold through the hand of *Osaka* merchants.

The feudal lords thus raised their necessary funds in *Osaka* and it was not long before the management of the various *Daimyo*'s finances was impossible without the assistance of *Osaka*. Thus during the rule of the *Tokugawa* Shogunate, *Osaka* prospered even more than while it was the political capital.

Since the feudalistic era of the *Tokugawa* Shogunate, *Osaka* has been Japan's largest city second only to *Edo* (Tokyo) and the one has

formed a contrast to the other in many ways.

The most striking contrast was that, throughout the 265 years of the *Tokugawa* regime, *Edo* was a *Samurai* (warrior)-dominated city. *Osaka*, on the other hand, even in the earliest days of that regime, was a city of rich men, imbued with the spirit of independance and reputedly held 70 percent of Japan's money in its hands. *Osaka* has been known as the "city of *Chonin*"...City of commoners where only integrity, brain and skill are respected and where only the efficient can survive.

The rice exchange at *Dojima* (closed shortly before the second world war) was the first and by far the oldest in Japan. The rice market of *Osaka* had also come to control the quotations throughout the country.

At *Kitahama*—now *Osaka's* center of banking and the securities business—was a public market where the "relative values of gold and silver" were fixed.

This institution gave birth to a national proverb, "Osaka fixes the value of every thing and its valuations pass current everywhere." Silver was the monetary unit in *Osaka*, gold in *Edo* (Tokyo).

#### IV

There was many *Nakama* and *Kabunakama* (merchant guild & craft guild), in *Osaka*. At first the official policy of *Tokugawa* rule was relatively liberal, but in closed economy, the limit of free commercial expansion was easily reached. Thus before long the merchant began to desire the creation of protective and self-regulative organizations. And this resulted in the formation of new guilds and associations generally called *Nakama*. Though not direct descendants of the earlier *Za* (guild in middle age), the *Nakama* represented a return to feudal regulation. When the *Nakama* was chartered by the *Bakufu*, they were called *Kabunakama*.

The monopoly organizations of *Kabunakama* cut out competition, set prices and limited membership. Such privileges were recognized and guaranteed by the *Bakufu* in return for payment of fee, *Myooga-kin* (a sort of monetary contribution or tax in the *Tokugawa* period). In

*Osaka* guilds were formed in almost all occupations, among which Twenty-four Guilds (*Nijushikumi-Doiya*) was the most famous.

*Osaka's* geographical position was no small help to the development of its commerce. Situated near the eastern extremity of the Inland Sea with easy access to the Pacific and criss-crossed by rivers and canals, the city had "1000 ships coming and 1000 ships going" dailly, as an old saying goes. For about three centuries during the *Tokugawa* regime, the city prospered as the chief port for the principal foodstuff of the nation.

However, it must be remembered that *Osaka's* water-borne traffic, in those days, was circumscribed by the Shogunate's policy of non-intercourse with foreign nations.

*Osaka* was the main port, but its activities were limited to domestic shipping. Of course at the beginning days of the *Tokugawa* regime, *Osaka* merchants did not confine their activities to domestic trade alone. This city was also a port for a considerable amount of overseas trade and her merchants used to send vessels to *Cochin-China*, *Siam*, *Tonkin*, *Cambodia*, and other foreign lands in competition with the English and the Dutch who were carrying on trade at *Hirado*, *Nagasaki*. The cut-throat competition of the shrewd *Osaka* merchants, "which maketh me altogether away of Japan" in the words of Richard Cocks, the successor of Saris, eventually obliged the English factory at *Hirado* to withdraw from the Japanese trade in 1623.

But the repressive nature of *Tokugawa* society was further accentuated by the adoption of the national policy of exclusion. Although this policy was the outcome of political rather than economic causes, it had the effect of confirming Japan's feudal rulers in their course of agrarian self-sufficiency at the same time as it drastically reduced the sphere of the merchant's activities and independence. Seclusion cut the merchant off from foreign trade and threw him back upon his own small undeveloped domestic market where he was at the mercy of the still vigorous feudal administration.

Furthermore, by removing Japan from the current of world development, seclusion kept from the Japanese its stimulus of intellectual

and technological progress which might have brought more rapid modernization. Under these circumstances, *Osakas*'s economic activities became also undergrown and stagnant.

But on the other hand, the *Tokugawa* regime presented the merchant with certain auspicious conditions for growth. The large *Tokugawa* domains, which included the major cities, brought under unified administration the greater portion of the land and permitted unimpaired commercial activities on a nearly nation-wide scale. In addition, a unified currency, ample communications, and long years of peace encouraged a rising standard of living. In the final analysis, however, it was the nature of feudal economy itself, in particular the nature of the relationship of the ruling class to its source of revenue, which worked to the advantage of the merchants. The military aristocracy in *Tokugawa* times differed from the *Bushi* of previous feudal periods by being concentrated in cities widely separated from the land which supported them. In this way an economic anomaly was created. The *Tokugawa bushi* became dependent upon the merchants as middlemen, a service group bridging the gap between city and countryside, between the consuming and producing segments of society. Thus whether they like it or not, the ruling class made the merchant its economic ally, while the merchant found in the warrior class his chief market. The long years of peace seriously undermined the financial resources of the military class and the feudatories were frequently constrained to borrow money from wealthy merchants and financiers. It was always to *Osaka* merchants that they came for financial help in time of need and thus by the latter half of the *Edo* period, the *Osaka* businessmen had risen from the most despised of all the social classes to the position where they held the key to the national economy and commanded the respect of lords and princes.

## v

Many *Daimyo* borrowed from *Osaka* merchants to keep their pots boiling. It was because, they had their own "*Kurayashiki*" in *Osaka*, as above-mentioned.

The majority of *Daimyo* had their *Kurayashiki* or warehousing quarters in *Osaka* or *Edo*, in order to facilitate the sale of their rice and other products raised in their respective territories. The *Daimyo* of Northern Japan had their *Kurayashiki* mostly in *Edo*, while those of Central and Western Japan including the *Kanto* district had their warehouse in *Osaka*, where the products brought there were either sold or mortgaged.

The warehousing official called *Kurayakunin* was in charge of each *Kurayashiki*. He was sent by the *Daimyo* who was the owner of the warehouse and he represented his lord. At first he also acted as *Kuramoto* or the keeper of the warehouse, but later the *Kuramoto* was assumed by a merchant of great wealth. He was in charge of receiving and delivery of warehouse goods. There was another official in the *Kurayashiki* who was in charge of the accounting of the transactions of warehouse goods and who was also often assumed by the *Kuramoto*.

The *Kakeya*, like the *Fudasashi* in *Edo*, was a financial agent for *Daimyo* and *Samurai* in general. He was usually given an annual grant of rice and treatment similar to that which was given to the chief retainer of a *Daimyo*. The foremost *Kuramoto* in *Osaka* was called *Konoike-Zenemon*, who was in the service of many *Daimyo* of such provinces as *Kaga*, *Hirosima*, *Awa*, *Okayama* and *Yanagawa*. He also rendered special service to the Lords of *Owari* and *Kii*, and his total fief amounted to 10,000 *Koku*. Thus such wealthy merchants as *Konoike-Zenemon*, *Hiranoya-Gohei* and *Tennojiya-Gohei* lived as extravagantly as a *Daimyo*.

Naturally enough, the *Kuramoto* possessed a powerful influence over the finance of the *Daimyo* he served. For instance, *Masuya-Heiemon*, an *Osaka* merchant, exercised an almost absolute power over the finance of the *Sendai-Han* in the capacity of its *Kuramoto*.

The settlement of loans advanced to *Daimyo* by merchants would often drag for many years with the passing of years, the former would find themselves in deeper waters, and they would frequently demand settlement by instalments or exemption of interest. Such a demand was usually accepted in case the merchants were in the capacity of

*Kuramoto*, because they were in a position to secure interest, receive annual grant of rice, and often received various gifts from the *Daimyo* whom they served; so that the principal could be returned in a period of ten years or so.

On the other hand, the merchants harassed by the repressive measures of irresponsible *Daimyo* knew how to deal with them. The merchants pledged among themselves not to make further advances to such *Daimyo* in the future, and this refusal often had electric effect.

The commoners also extended their financial arm over to the farm districts where there was an unmistakable tendency of land concentration. We may naturally conceive, therefore, that transactions in land and borrowing of money for other agricultural purposes were no longer limited to farmers themselves, for merchants gradually came to participate in them to a great extents. Many merchants possessed concentrated lands and newly developed lands. Many commoners took an active part in the enterprise of developing new lands for agricultural purposes. In the suburbs of *Osaka* there were many new lands developed by the capital of commoners; for example, *Konoike Sinden*, *Hishiya Sinden*, etc. The development of new rice fields at *Fukano* undertaken by the Branch Temple of *Hongan-ji* at *Namba*, *Osaka*, in April, the second year of *Hoei* (1705), was participated in by many *Chonin* of *Osaka*; and about the seventh year of *Kyoho* (1722), the northern half of the fields had come into possession of the *Konoike* family and southern half, that of *Hirano* family.

The manifesto issued by *Oshio-Heihachiro* in part says; "The wealthy *Chonin* of *Osaka* in recent years have been exploiting *Daimyo* by putting them under vast pecuniary obligations, and thus by getting an enormous amount of money and annual stipends of rice. They have been living like princes. Despite their being *Chonin*, they would be appointed *Karo* or *Yonin* by *Daimyo*. They possess fields and newly cultivated lands of their own, and are living in a very luxurious manner".

## VI

During the *Tokugawa* period, especially in its latter half, the commoner class of *Osaka* not only had already come to control the financial

power of the nation, but also had participated in the nation's culture and learning.

It was also in *Osaka* that the literature of the common people originated. As *Osaka*'s contribution to the national culture, she produced such men as *Chikamatsu Monzaemon* (sometimes called the "Shakespeare of Japan") and *Takeda Izumo*, both great dramatists of the puppet stage, the novelist *Ihara Shaikaku* and the scholar-priest *Keichu* who with many others, did much by their artistry and learning to raise the dignity of the common people to a new and unprecedented level. But perhaps the cultural honour to which the people of *Osaka* may lay the greatest claim is the development of the puppet-drama (*Bunraku*), an art which profoundly influenced the evolution of *Kabuki* and has since won the acclaim of people from all parts of the world. Also, *Osaka* produced such conspicuous men of letters as *Yosano Buson*, composer of *Hokku*, seventeen syllable verse.

The progressive and active commons demanded a fresh and practical philosophy of life, and it was to meet this new requirements by a rising class that *Shingaku* came to be popular among the merchants. In the *Kyoto-Osaka* district many scholars taught *Singaku*. For instance two noted *Osaka* scholars, *Yamagata-Banto* and *Kusama-Naokata*, were also commoners. *Banto* was the head clerk of an exchange shop, namely, *Masuya-Heiemon*. He is the author of a great work called "*Yume no Shiro*". *Kusama-Naokata* was first in the service of the *Konoike* Family and later opened an exchange shop of his own. He also wrote a book called "*Sanka-Zui*". There was a lecture hall in *Osaka* which was called *Kaitokudo*. It was founded by two scholars, namely *Miyake-Sekian* and *Nakai-Shuan*. Here, lectures were given to commoners and artisans. Two *Nakai* brothers, namely, *Chikuzan* and *Kiken* outlined economic theories of considerable importance. *Banto* was also a pupil of these two brothers. During the Tokugawa period, especially in its latter half, the commoner class of *Osaka* not only had already come to control the financial power of the nation, but also had participated in the nation's culture and learning.

Activities of *Osaka* people were not confined to economic and cul-

tural fields. Osaka had a very good system of neighbourhood associations to safeguard the interests of local communities. It also had an excellent working system of volunteer fire-fighting force. Even in those days when distinction between the governing class and the governed was so precise and definite, the Shogun Government could not ignore the ability of Osaka people to govern themselves and had to appoint twenty-one "So-toshiyori" or aldermen to participate in the administration of *Osaka* and to help the "Jodai", the local representative of *Shogun*.

## VII

In 1837 the peace of *Osaka* was shattered by a tragic and unprecedented event. As a result of one bad harvest following another, the price of rice and other cereals rose to astronomical figures and the people consequently suffered the most terrible hardship. Driven to desperation by the sight of the people's suffering and by his own failure to obtain from wealthy folks a sufficient measure of aid, an *Osaka* police official and scholar of the *Wang-Yang-Ming* philosophy named *Oshio-Heihachiro* (above mentioned) raised the flag of revolt and became the instrument of starting a tumult in which 18,000 buildings were destroyed. This was the first time in the history of *Edo* period that a scholar become the control figure of such an uprising as this, and it seems to make a breakaway from the traditional feudal way of thinking. It is especially significant that *Osaka* should have the scene of this incident, because in this city there had developed a new culture, a culture of the masses as opposed to that of the millitary class, which, combined with the ever-growing power of the merchant princes, was rapidly undermining the very foundations of the feudal system.

But it must be regrettable that politically and socially the commercial class played a surprisingly minor role in the momentous years on either side of the *Meiji* Restoration. In spite of the remarkable growth of pre-capitalistic economy in *Tokugawa* Japan, almost all the great merchants of that period in *Osaka* were of old style and remained politically and economically backward. Though the "penetration of money

economy" formed a leaven for change in 19th century Japan, the chief bearers of that economy failed to become an anti-feudal force of any consequence.

As I have stated, the economic activity of the *Chonin* class had its limitations. One of these limitations was evidenced in the business transactions between the *Chonin* and the *Samurai* classes. And since the principal use made by rich merchants of their amassed wealth was to make loans to *Samurai*, and the prosperity of the *Chonin* class depended on the existence of the *Samurai* class, the elimination of the feudal system meant the bankruptcy of the *Chonin*, rich *Chonin* especially. The sphere of the activity of the *Chonin* class was restricted both qualitatively and quantitatively. The *Chonin* class failed to utilize the good opportunity which the development of currency economy afforded them of making a big advance and realizing capitalistic economy.

In the closing days of *Tokugawa* period, *Osaka* gradually lost its place as the center of commercial activities.

Toward the close of the *Edo* period, the population of *Osaka* diminished rapidly, due to the increasingly heavy burdens laid upon its citizens by famines, high prices and government levies. The population of *Osaka* went up to 422,359 in 1764, but declined to 281,306 by 1868, the year when the *Meiji* Restoration took place.

The opening of ports in the closing days of the *Tokugawa* Shogunate enabled merchants to engage in foreign trade, but before they had time to make full use of the new opportunity, the *Meiji* Restoration came. On the other hand, with the opening of ports to foreign trade in 1858 the *Kabunakama* system quickly passed out of existance. In the new ports, *Yokohama* and *Kobe*, new commercial practices and new enconomic necessities made obsolete the older merchant guilds.

Temporary lawlessness reigned in *Osaka* during and after the transition from *Tokugawa* rule to Imperial rule. The Emperor *Meiji*, who ascended the throne in 1863 upon the restoration of Imperial rule, came down to the then perturbed *Osaka*. He stayed there for 20 days. His presence restored peace and order.

## VIII

*Osaka* merchants gave lots of money to the cause of restoring Imperial rule. This helped a great deal in the setting up of the loyalist government that ensued from the Restoration—the so-called *Meiji* Government, after the *Meiji* era that opened in 1868 and closed with the demise of the Emperor *Meiji* in 1912. In *Meiji* Restoration the forced loans extended by big three financial houses—*Mitsui*, *Shimada*, and *Ono*—enable the new government to defray its immediate expenses. But it was faced by the need of raising funds for sending a punitive expedition to *Edo*. The Emperor *Meiji*'s visit to *Osaka*, had a purpose to raise this fund (*Goyokin*). Although a few wealthy persons played a prominent role in the raising of this money, many others in *Osaka*, *Sakai*, and other towns in the old province of *Settsu* made contributions in various amounts. It is an undeniable fact that the raising of the funds was participated in by many instead of few.

It was the *samurai* of the lower ranks who actually carried out the political reformation of the *Meiji* Restoration, and there is no denying that the activities of *Chonin* participating in the same movement were characterised by passivity. But the establishment of the *Meiji* Government would not be possible without the financial assistance of *Chonin*, particularly those in *Osaka*. For this reason, the efforts made by the *Osaka Chonin* in the Restoration movement cannot be lightly regarded, although they appear to have been passive. Moreover although few *Osaka Chonin* played the role of leadership, a large number of *Chonin* in *Osaka* also participated in the movement and its final success was due to their cooperation and assistance. The *Meiji* Restoration was accomplished essentially by a coalition of feudal forces with the city merchants and commercialized country gentry. Therefore we cannot deny the great role of *Osaka* businessmen in that memorable time.

But this fact gave the regrettable consequence to the accumulation of the commercial capital in *Osaka*. *Osaka*'s wealth was exhausted in this time.

Yet the economic policy of the *Meiji* administration was disastrous to its benefactors. It broke up “*Kabunakama*”—the merchants' guilds.

This action, on the face of it, destroyed a feudalistic system of commerce and assured equality of business opportunity for all. But it had the effect of ending the time-honored business practice abruptly and paralyzing commercial *Osaka* temporarily.

The standardization of coinage to gold system by the new administration threw the silver-based *Osaka* money market into confusion, involving some bankruptcies.

Furthermore, the new Government issued an edict that financial liabilities incurred by fief lords—who went out with the Restoration—up to a certain date be cancelled outright and that their more recent indebtedness might be paid in interest-free yearly instalments. Many of the wealthy *Osaka* merchants who were creditors to former fief lords went broke.

## IX

For the first 10 years or so of the *Meiji* era, therefore, commercial *Osaka* was dead. Yet, in the meantime, *Osaka* was literally making money; a mint even has been established in this city.

Even the policy of isolation in *Tokugawa Shogunate* was discarded in the closing years of *Meiji* Restoration and the market and port of *Osaka* was opened to foreign trade by the new government in 1868. But owing to the domestic nature of the operations in the preceding period, the harbour was not in a condition to permit the entrance of the larger vessels used in deep-sea shipping. In those days, the annual flood and sediment washed down by the *Yodo* River made the maintenance of the river channel difficult. The sand bars at the river mouth further handicapped the harbour. Only small vessels were able to come up the *Ajikawa* waterway during the high tide to reach the whares at *Kawaguchi* and the goods on ocean-going vessels had to be transshipped either by lighters or railway at *Kobe*.

The civil strife at 1877—the rebellion of *Takamori Saigo* in *Kyushu*—set off a nation-wide boom and *Osaka* received its share. The boom was as brief as the strife, and *Osaka* soon relapsed into lifelessness. For some years commercial *Osaka*'s fate trembled between resurrection

and extinction.

People bearing *Osaka*'s future in mind racked their brains to help retrieve its fortunes. One of the well-wishers, a ranking government official in *Tokyo*, urged the industrialization of *Osaka*.

Whether under his inspiration or not, a variety of industries sprang up in *Osaka* after 1816—cotton, hosiery, glass, cement, brush, machinery, and even shipbuilding. Since then the development of *Osaka* has been remarkable, with rapid industrialization and westernization.

The Sino-Japanese war of 1894–5 speeded up their development. In 1895 *Osaka* already accounted for 40 per cent of Japan's total cotton spindlage. With the subsequent introduction of Western spinning machinery into Japan, it became the scene of phenomenal progress in industrial enterprises, which represents one of the most remarkable features of modern Japan.

A project with added considerable impetus to *Osaka*'s development as a center of commerce and industry was the harbour construction work undertaken with municipal harbour in Japan. This modern harbour was built at a cost of 18 million yen which was roughly twenty times the annual expenditure of the city at that time and this without the help of either the Central Government or the prefecture. And a record of that time says that the Municipal Assembly unanimously passed this staggering bill without turning a hair.

Indeed it was a municipal undertaking—an undertaking of local self-governing body, whereas the harbours of *Kobe* and *Yokohama* were built by the central government.

*Osaka*'s history from then on was a history of commercial and industrial expansion, which was aided by the Russo-Japanese War of 1904–5 and World War I. Since then, *Osaka* has grown by leaps and bounds until it is now one of the largest cities in the world and called, very fairly, according to some staunch Osakans, the "Manchester of the Orient".

The city was incorporated in 1889 with a population of 472,247 but the time the 1st National Census was taken in 1920 the figure had increased to 1,252,983. This trend continued until 1940 when it reached

3,252,340, the highest ever recorded in *Osaka*, at the 5th National Census.

We must say that *Osaka* has relied on its own energy and economic power and never on the Central authorities to build the city into what it is to-day. As I have stated, *Osaka* was the city of *Chonin*. This tradition has made up *Osaka* perfectly a self-made City.

\* *Osaka's* subway is the only municipal one even now and its university is the oldest municipal educational institution of university grade in Japan. *Osaka's* was the first modern water-supply system ever undertaken by any city in Japan although *Tokyo* had an older one built by the *Shogun* Government in the *Tokugawa* era. This was started in 1892 at a cost of 2,400,000 yen which was just three times the amount of the City's total budget of that year. *Osaka* was also first in the field of public welfare service. Instead of leaving it in the hand of charities, the city took it up on its own shoulders in 1919, when the Central Government had not even started thinking about this subject seriously.

Being the commercial and industrial center of the country, *Osaka* has been known as "the heart of Japan's economy". In 1937, the city's total production constituted as much as 16 per cent of Japan's entire industrial output. Texile production, export goods manufacturing and other peace industries were the major industrial activities of the city in the late thirties.

## X

We must say that economic freedom is the most conspicuous characteristics and traditions of *Osaka* did not like to come under the *yoke* of centralism and its brother began to set in as the Manchurian Incident of 1931 opened the prelude to an era of economic controls, which increased progressively both in number and in severity with the China Incident of 1937 and the Pacific war.

*Osaka* was hit all the harder by the economic controls for being a commercial city and for the fact that most of its industries were independent of government protection, aid or influence. The peace industries of *Osaka* which were unable to meet the Government demand for

conversion into chemical and heavy industries, declined to a considerable extent. The progress of the war sharply diminished the importance of the city's peace industries.

The compulsory "readjustment of enterprises", the dispersion of factories in the late days of the war and the airraids of early 1945 combined to reduce *Osaka's* population.

Moreover, havoc wrought upon the city's industrial facilities during the war was tremendous.

With the restoration of peace, the reconstruction of the war-torn industrial facilities of the city made speedy and striking progress.

At the end of 1949, such industrial plants accounted for nearly 10 per cent of the total number of factories in Japan. The number of factory workers of the city stood at 10 per cent of the national figure and the city production amounted to 12 per cent of the nation's total output.

The dispersion and evacuation of industries due to the war began to tell on the population figure about this time and finally went down to its lowest after the large-scale air-raids just before the end of the war which reduced nearly one third of the City to ashes, and thus the population had decreased to 1, 102, 958 by November 1, 1954. Osaka was less than a shadow of its former self.

With the progress of rehabilitation, however, it has been steadily recovering. Post-war reconstruction has been progressing steadily. Already, as of October 1950, the city's population increased to 1, 956, 136 and the latest reliable estimate put it at 2, 195, 541 as of July 1, 1952. Osaka lost over half of its houses during the war. Despite the slow recovery of housing, however, shopping and amusement quarters surpass those of prewar days.

With the outbreak of the Korean War in June, 1950, the industrial activities of the city have made a considerable increase with a corresponding increase of the number plants and workers. Thus Osaka received its share of the first postwar boom in Japan,—the Korean war boom—but, since 1951, it has been in a condition of slump due to the international business recession.

For the most part, Osaka's industries have always been light industries—textile, light machinery, light metal and "sundries" (lotions or trinkets). This fact indicates that medium and small-sized industries make up a large proportion of the total. Capital invested in *Osaka's* industries has been mostly private.

*Osaka* is traditionally a city of wholesale merchants. It has far more wholesalers than any other commercial city of Japan. *Osaka's* textile and "sundries" wholesale trades have been busy since the resumption of private export trade in August 1948.

*Osaka's* export trade before the war was largely with the so-called yen bloc—China, Manchuria, and Korea. It has been hit hard by the suspension of trade with Red China. *Osaka* was famous with a number of canals connected with the *Yodo* River forming the great watercourse of the city. That is why *Osaka* has often been described as "the Venice of Japan". However with the construction of railways and other land transportation facilities, the innumerable canals which once played an important role as a means of communication have largely lost their value after the World War II.

To say that *Osaka* is in its element in times of free, unrestrained competitive business is to size up the city aptly and correctly. *Osaka's* return to its pre-war prosperity will, therefore, depend on *Japan's* complete return to free economy.

# ON UNIFORMITY AND CONTINUITY CONDITIONS IN THE THEORY OF CONSUMER'S CHOICE

TAMOTSU YOKOYAMA

## *Introduction*

We consider  $n$  different goods and denote the various combinations of these goods by  $X = (x_1, x_2, \dots, x_n)$ ,  $Y = (y_1, y_2, \dots, y_n)$ ,  $\dots$ . By consumer's choice we mean a relation  $r$  defined in a set  $\mathfrak{M}$  consisting of such combinations of goods which satisfies following conditions: 1) For all  $X$  and  $Y$ , either  $XrY$  or  $YrX$ . 2) For all  $X$ ,  $XrX$ . 3)  $XrY$  and  $YrZ$  imply  $XrZ$ . 4) If  $X \geq Y$ , that is, if  $x_i \geq y_i$ ,  $i = 1, 2, \dots, n$ , then  $XrY$  and if  $X > Y$ , that is, if  $x_i \geq y_i$ ,  $i = 1, 2, \dots, n$  and  $x_i \neq y_i$  for some  $i$ , then *not*  $YrX$ . From this relation  $r$ ,  $X$  *ind.*  $Y$  (i. e.  $X$  is indifferent to  $Y$ ) is defined to mean  $XrY$  and  $YrX$ , and  $X$  *pref.*  $Y$  (i. e.  $X$  is preferred to  $Y$ ) is defined to mean *not*  $YrX$ .

Let  $p_1, p_2, \dots, p_n$  be the prices of  $n$  goods and  $I$  be the consumer's income. Then we define the consumer's demand as the most preferred element in the set of all  $X$  in  $\mathfrak{M}$  such that  $P \cdot X = \sum_{i=1}^n p_i x_i \leq I$ . This means that  $D$  is the consumer's demand under  $P$  and  $I$  if and only if for any  $X$  in  $\mathfrak{M}$  such that  $P \cdot X \leq I$ , always  $DrX$ .

Now in the theory of consumer's demand it may naturally be required that the consumer's choice  $r$  must have the property that if  $XrX^*$  implies  $P \cdot X \geq P \cdot X^*$ , then  $P \cdot Y \leq P \cdot X^*$  implies  $X^*rY$ , that is,  $X^*$  is the consumer's demand under  $P$  and  $I = P \cdot X^*$ . This property relates to Prof. Hicks' interpretation of the substitution and income effects of the fundamental equation of value theory. And this was already discussed in my preceding paper. I have shown that to add one more condition to consumer's choice  $r$ , that is, to add condition 5: "If  $X$  *pref.*  $Y$ , there exists at least one  $Z$  which satisfies  $Z$  *ind.*  $Y$  and  $Z < Y$ ," is sufficient for Prof. Hicks' interpretation of the two terms of the fundamental equation of value theory. We call this con-

dition uniformity condition. In this paper we show that continuity conditions given in the followings are also sufficient and discuss the relations which exist between uniformity condition, continuity conditions and Prof. Wold's axiom of continuity.

### *Continuity Conditions and Uniformity Condition*

In the followings we assume that  $\mathfrak{M}$  consists of all  $X$  such that  $x_i \geq 0$ ,  $i = 1, 2, \dots, n$ , where  $x_i$ 's are real numbers. Define the distance between two elements  $X, Y$  of  $\mathfrak{M}$  by

$$\rho(X, Y) = \sqrt{\sum_{i=1}^n (x_i - y_i)^2}.$$

A sequence  $\{X_i\}$  is said to converge to  $X$  when

$$\lim_{n \rightarrow \infty} \rho(X_n, X) = 0.$$

We define  $X+Y$  to mean  $(x_1+y_1, x_2+y_2, \dots, x_n+y_n)$  and 0 to mean  $(0, 0, \dots, 0)$ . A element  $X$  is called positive element when  $x_i > 0$ ,  $i = 1, 2, \dots, n$ .

*Weak Continuity Condition:* Let  $\{\varepsilon_i\}$  be a sequence of positive elements which converges to 0. Then  $\bar{X} + \varepsilon_i r X r \bar{X}$ ,  $i = 1, 2, \dots$  ad inf. implies  $X$  ind.  $\bar{X}$ , and  $\bar{X} r X r \bar{X} - \varepsilon_i$ ,  $i = 1, 2, \dots$  ad inf. also implies  $X$  ind.  $\bar{X}$ .

*Strong Continuity Condition:* Let  $\{X_i\}$  be a sequence which converges to  $X$ . Then  $X_i r Y r X$ ,  $i = 1, 2, \dots$  ad inf. implies  $X$  ind.  $Y$ , and  $X r Y r X_i$ ,  $i = 1, 2, \dots$  ad inf. also implies  $X$  ind.  $Y$ .

Now Prof. Wold introduced the following axiom of continuity in his development of consumer's demand theory.

*Prof. Wold's Axiom of Continuity:* Let  $q^{(1)}, q^{(2)}, q^{(3)}$  be any budget such that  $q^{(1)}$  is preferred to  $q^{(2)}$ , and  $q^{(2)}$  to  $q^{(3)}$ . Let  $L$  be the line in the budget space that connects  $q^{(1)}$  with  $q^{(3)}$ . Then  $L$  passes through a budget  $q$  that is equivalent to  $q^{(2)}$ .

First we show that strong continuity condition is sufficient for Prof. Wold's axiom of continuity.

Suppose  $r$  satisfies strong continuity condition. Let  $q^{(1)}$  is preferred to  $q^{(2)}$ , and  $q^{(2)}$  to  $q^{(3)}$  and  $L$  be the line which connects  $q^{(1)}$  with  $q^{(3)}$ .

We define a function  $q(t)$ ,  $0 \leq t \leq 1$  such that  $q(t)$  runs on  $L$  from  $q^{(3)}$  to  $q^{(1)}$  as  $t$  changes from 0 to 1. Consider the set  $T$  of  $t$  such that for  $0 \leq s \leq t$ ,  $q^{(2)}r q(s)$ . This set  $T$  is bounded and has a least upper bound which we denote by  $t_0$ .

If  $q(t_0)$  does not belong to  $\{q(t) | t \in T\}$ , because from  $\{q(t) | t \in T\}$  we can find a sequence of elements  $\{q(t_i)\}$  which converges to  $q(t_0)$ , we have  $q(t_0) \text{ pref. } q^{(2)}r q(t_i)$ ,  $i = 1, 2, \dots$  ad inf. Then by strong continuity condition we have  $q(t_0) \text{ ind. } q^{(2)}$ .

If  $q(t_0)$  belongs to  $\{q(t) | t \in T\}$ , then for any  $\varepsilon > 0$ , there exists  $s$  such that  $t_0 < s < t_0 + \varepsilon$  and  $q(s) \text{ pref. } q^{(2)}$ , because  $t_0$  is the least upper bound of the set of  $t$  such that for  $0 \leq s \leq t$ ,  $q^{(2)}r q(s)$ . Consider a sequence  $q(s_i)$ ,  $t_0 < s_i < t_0 + \varepsilon$ ,  $i = 1, 2, \dots$  ad inf. which converges to  $q(t_0)$  and satisfies  $q(s_i) \text{ pref. } q^{(2)}r q(t_0)$ . Then by strong continuity condition we have  $q(t_0) \text{ ind. } q^{(2)}$ .

Thus we have shown that strong continuity condition is sufficient for Prof. Wold's axiom of continuity.

Next we show that Prof. Wold's axiom of continuity is sufficient for weak continuity condition.

Let  $\{\varepsilon_i\}$  be a sequence of positive elements which converges to 0. And let  $\bar{X} + \varepsilon_i r X r \bar{X}$  for  $i = 1, 2, \dots$  ad inf. Suppose Prof. Wold's axiom of continuity is satisfied. To show  $X \text{ ind. } \bar{X}$ , it is sufficient to show not  $X \text{ pref. } \bar{X}$ , because  $X r \bar{X}$ .

Suppose  $\bar{X} + \varepsilon_i \text{ ind. } X$  for some  $i$ . Then let  $\rho^* = \min_j \varepsilon_{ij} > 0$ , where  $\varepsilon_{ij}$  is the  $j$ -th component of  $\varepsilon_i$ . Because  $\{\varepsilon_i\}$  is a sequence of positive elements converges to 0, from  $\{\varepsilon_i\}$  we can find a positive element such that  $\rho(\varepsilon_j, 0) < \rho^*$ . Thus we have  $\varepsilon_j > \varepsilon_i$ , and  $\bar{X} + \varepsilon_j r X$ . From this we have  $\bar{X} + \varepsilon_i \text{ pref. } \bar{X} + \varepsilon_j r X$ , which contradicts  $\bar{X} + \varepsilon_i \text{ ind. } X$ . Therefore, it must be that for any  $i$ ,  $\bar{X} + \varepsilon_i \text{ pref. } X$ .

Now suppose that  $\bar{X} + \varepsilon_i \text{ pref. } X \text{ pref. } \bar{X}$ . Then from Prof. Wold's axiom of continuity the straight line which connects  $\bar{X}$  with  $\bar{X} + \varepsilon_i$  contains  $\bar{X} + \theta \varepsilon_i$ ,  $0 < \theta < 1$  which is indifferent to  $X$ . Because  $\{\varepsilon_i\}$  is a sequence of positive elements which converges to 0, from  $\{\varepsilon_i\}$  we can find a positive element  $\varepsilon_j$  which is smaller than  $\theta \varepsilon_i$ . Thus we have  $\bar{X} + \theta \varepsilon_i \text{ pref. } \bar{X} + \varepsilon_j \text{ pref. } X$ , which contradicts  $\bar{X} + \theta \varepsilon_i \text{ ind. } X$ .

Therefore,  $X \mathbf{r} \bar{X}$  and *not*  $X \text{ pref. } \bar{X}$ , that is,  $X \text{ ind. } \bar{X}$ .

Thus we have shown that Prof. Wold's axiom of continuity is sufficient for weak continuity condition.

Now uniformity condition which I introduced in my development of consumer's demand theory is the following condition.

*Uniformity Condition:* *If  $X \text{ pref. } Y$ , there exists at least one  $Z$  which satisfies  $Z \text{ ind. } Y$  and  $Z < X$ .*

That Prof. Wold's axiom of continuity is sufficient for this uniformity condition is shown as follows. If  $Y = 0$ , uniformity condition is trivial. So we assume that  $Y \neq 0$ . Let  $L$  be the straight line which connects  $X$  with 0. Then Prof. Wold's axiom of continuity asserts that  $L$  contains  $Z$  which is indifferent to  $Y$ , because  $X \text{ pref. } Y \text{ pref. } 0$ . And that this  $Z$  satisfies  $Z < X$  is evident.

As was already shown strong continuity condition is sufficient for Prof. Wold's axiom of continuity. Followingly, from above consideration it is clear that strong continuity condition is also sufficient for uniformity condition.

Next we show that weak continuity condition is sufficient for uniformity condition when  $X$  of uniformity condition is a positive element.

Suppose  $X \text{ pref. } Y$ . If  $Y < X$ , uniformity condition is quite trivial. So we assume that  $Y$  is not smaller than  $X$ . Because  $X$  is a positive element, we can find  $X' = kX$ ,  $k > 0$  such that  $X' = kX > Y$ . Let  $L$  be the straight line which connects  $X'$  with 0. Suppose that  $L$  contains no element which is indifferent to  $Y$ . Then we divide  $L$  into two subsets, one of which consists of all  $A$  such that  $A \text{ pref. } Y$  and the other of which consists of all  $B$  such that  $Y \text{ pref. } B$ . We denote the former subset by  $E_1$  and the latter by  $E_2$ . Because if  $A \in E_1$ , the segment  $YA$  is contained in  $E_1$  and if  $B \in E_2$ , the segment  $OB$  is contained in  $E_2$ , the two subsets  $E_1$ ,  $E_2$  define a section  $(E_1, E_2)$  on  $L$  which we denote by  $\bar{X}$ .

First suppose that  $\bar{X} \in E_1$ . Then we can choose a sequence of positive elements  $\{\varepsilon_i\}$  which converges to 0 and make  $\{\bar{X} - \varepsilon_i\}$  contained in  $E_2$ . Thus we have  $\bar{X} \text{ pref. } Y \text{ pref. } \bar{X} - \varepsilon_i$ ,  $i = 1, 2, \dots$  ad inf., where  $\{\varepsilon_i\}$  is a sequence of positive elements which converges to 0 and  $\bar{X}$  cannot be

indifferent to  $Y$ . This conflicts with weak continuity condition.

Next suppose that  $\bar{X} \in E_2$ . Then we can proceed quite similarly and have  $\bar{X} + \varepsilon_i \text{ pref. } Y \text{ pref. } \bar{X}$ ,  $i = 1, 2, \dots$  ad inf., where  $\{\varepsilon_i\}$  is a sequence of positive elements which converges to 0 and  $\bar{X}$  cannot be indifferent to  $Y$ . And this also conflicts with weak continuity condition.

Therefore, if weak continuity condition is satisfied,  $L$  contains  $Z$  which is indifferent to  $Y$ . Because  $X$  and  $Z$  are both contained in  $L$  which connects  $X'$  with 0, either  $X > Z$  or  $Z > X$ . And because  $Z > X$  implies  $Z \text{ pref. } X$  which contradicts  $X \text{ pref. } Y \text{ ind. } Z$ , it must be that  $X > Z$ .

Thus we have shown that if  $X$  is a positive element, then weak continuity condition is sufficient for uniformity condition.

When  $\mathfrak{M}$  consists of all  $X$  such that  $x_i \geq 0$ ,  $i = 1, 2, \dots, n$  where  $x_i$ 's are real numbers, we call the set  $\mathfrak{M}'$  which consists of all positive elements the interior of  $\mathfrak{M}$ . Then what we have shown is that in the interior of  $\mathfrak{M}$  uniformity condition is weaker than weak continuity condition.

#### *The Fundamental Property of Consumer's Demand*

The consumer's demand is defined as the most preferred element in the set of all  $X$  in  $\mathfrak{M}$  such that  $P \cdot X \leq I$ . However, when  $X^*$  is the cheapest element among the all elements of  $\mathfrak{M}$  which are preferred to or indifferent to  $X^*$ , then  $X^*$  is naturally required to be the consumer's demand. These are the two sides of consumer's demand.

*The Fundamental Property of Consumer's Demand:* If  $X r X^*$  implies  $P \cdot X \geq P \cdot X^*$ , then  $P \cdot Y \leq P \cdot X^*$  implies  $X^* r Y$ .

In this section we show that each of strong continuity condition, Prof. Wold's axiom of continuity and uniformity condition given in the preceding section is sufficient for this property and that weak continuity condition is sufficient for this property in the interior of  $\mathfrak{M}$ . As was shown above, each of strong continuity condition and Prof. Wold's axiom of continuity is sufficient for uniformity condition. Followingly, what we have to show is that each of uniformity condition and weak continuity condition is sufficient for this property.

First we show that uniformity condition is sufficient for this property.

Suppose that the fundamental property does not hold. Then there exists  $Y$  such that  $P \cdot Y \leq P \cdot X^*$  and  $Y \text{ pref. } X^*$ . Because  $Y \text{ pref. } X^*$  implies  $Y \succ X^*$ , it follows that  $P \cdot Y \geq P \cdot X^*$ . Thus we have  $P \cdot Y = P \cdot X^*$ . Because  $Y \text{ pref. } X^*$ , uniformity condition asserts that there exists  $Z$  such that  $Y > Z$  and  $Z \text{ ind. } X^*$ . Then for this  $Z$  we have  $P \cdot Z < P \cdot Y = P \cdot X^*$  and  $Z \succ X^*$ , which conflicts with the assumption that when  $Z \succ X^*$ ,  $P \cdot Z \geq P \cdot X^*$ .

Thus we have shown that uniformity condition is sufficient for the fundamental property of consumer's demand.

Next we show that weak continuity condition is sufficient for the fundamental property of consumer's demand in the interior of  $\mathfrak{M}$ . This follows at once from the above shown results that in the interior of  $\mathfrak{M}$  weak continuity condition is sufficient for uniformity condition and uniformity condition is sufficient for the fundamental property of consumer's demand. However, we show this in another way.

Suppose that the fundamental property of consumer's demand does not hold. Then as was shown above, we have  $Y \text{ pref. } X^*$  and  $P \cdot Y = P \cdot X^*$ . Because  $Y$  lies in the interior of  $\mathfrak{M}$ , we can choose a sequence  $\{\varepsilon_i\}$  of positive elements which converges to 0 and can make  $\{Y - \varepsilon_i\}$  lie in the interior of  $\mathfrak{M}$  for all  $i$ . Suppose  $X^* \succ Y - \varepsilon_i$  for all  $i$ . Then because  $Y \text{ pref. } X^* \succ Y - \varepsilon_i$ , the weak continuity condition asserts that  $Y \text{ ind. } X^*$ , which contradicts  $Y \text{ pref. } X^*$ . Thus it must be that  $Y - \varepsilon_i \text{ pref. } X^*$  for some  $i$ . But from  $P \cdot Y = P \cdot X^*$  it follows that  $P \cdot (Y - \varepsilon_i) = P \cdot Y - P \cdot \varepsilon_i < P \cdot X^*$ , which conflicts with the assumption that when  $Z \succ X^*$ , always  $P \cdot Z \geq P \cdot X^*$ .

Thus we have shown that in the interior of  $\mathfrak{M}$ , weak continuity condition is sufficient for the fundamental property of consumer's demand.

### *Some Remarks*

As was already shown, uniformity condition is weaker than strong continuity condition or Prof. Wold's axiom of continuity and is weaker

in the interior of  $\mathfrak{M}$  than weak continuity condition. And it gives the fundamental property to consumer's demand in the whole region of  $\mathfrak{M}$ . Thus uniformity condition is quite important in the development of consumer's demand theory.

Moreover, uniformity condition is sufficient to develop consumer's demand theory in a discrete set of combinations of goods. In general the quantities of goods cannot change continuously. There usually exist the least units by which the goods are measured. In such a case continuity conditions have no meaning. However, uniformity condition has its full meaning even when  $\mathfrak{M}$  is a discrete set. And the proof which shows that uniformity condition is sufficient for the fundamental property of consumer's demand can also be applied to the case where  $\mathfrak{M}$  is a discrete set without any modifications.

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## A NOTE ON THE TRADE CYCLE AND INTERNATIONAL TRADE

TARO WATANABE

Referring to an international aspect of the trade cycle in the last chapter of his excellent book, *A Contribution to the Theory of the Trade Cycle*, Professor Hicks suggests that 'the processes which the real theory studies are not made different in character by the fact that they extend across national frontiers.' It is the reason why his consideration was restricted to the monetary side of international trade. I believe, however, more than his suggestion can be made on the real side.

### I

To begin with, we summarize Hicks theory on the expansion and the turn-down. Suppose an upward impact on the economy. Then, increases in effective demand, in combination with the assumed strong accelerator, cause it to follow an explosive path. But it is impossible for output to expand without limit. The expansion has to be checked by some physical factor—the ceiling. Once it occurs, output precipitously turns downwards without remaining at its highest level. For sluggish production causes induced investment to drop to zero or its neighbourhood at a stroke, which in turn is followed by a drastic fall in output.<sup>1</sup>

Hicks is vague in what he means by the 'ceiling.' He means by it the level of full employment in one place, and the full utilization of capital equipment in the other.<sup>2</sup> It is not guaranteed that the two are reached at the same time. One of them are likely to be situated below than the other and therefore to work more effectively as a check. However,

1. Cf. Hicks, *Trade Cycle*, pp. 95-101.

2. Cf., moreover, Harrod, *Towards a Dynamic Economics* (London, 1948), p. 87, and Joan Robinson, *The Rate of Interest and Other Essays* (London, 1952), pp. 126-135.

the matter may not worry us here for the following reason. In the open system the upward movement may hit the monetary ceiling before it does any of the real ceilings——perhaps with large probability in many countries. Generally speaking, the period of a boom is at the same time the period of an unfavourable balance of payments. In spite of their international umbalance some countries may be provided with abundant international currency reserves enough to leave the boom to take its own course. On the other hand, other countries provided with poor reserves are, however, compelled to cut it off with the purpose of avoiding the international-payments crises, possibly far before any of the real ceilings would be reached. The latter case applies, I guess, to a great majority of countries exclusive of the United States and a few of others. If my guess is justified, it follows that any attempt at explaining the actual fluctuations in terms of real output alone may often lead to serious errors.

A drastic increase in the rate of interest is often asked for to cut off a boom successfully and to protect the economy from exhaustion of the reserves. The period of a boom is, generally speaking, the period of high profits. Then a lukewarm increase in the rate of interest is never sufficient to deal a severe blow at the business. Everyone knows it. But it is sometimes difficult to carry out the above requirement. There seems, however, to be no other way to solve fundamentally the balance-of-payments problem. Indeed it is possible temporarily to tide over a crisis by such means as foreign borrowings, exchange depreciations, or import controls, but they are only temporary in their effects. If the authorities are busy about balancing the international payments, leaving the domestic matters to take their own courses, a boom will be increased in strength through the channels of the additional domestic demand induced by these measures, which is just contrary to their objectives. Accordingly, if these measures are to be effective at all, they have to be carried out with more and more rigour. On the other hand, successive increases in rigour might introduce another intricate factor of speculation into the problem.

In the countries where so abundant reserves are available that the

monetary ceiling is situated near by, though below, the real ceilings, or above them, the process of the down-turn may be different from those described above. Namely a boom may die a natural death, before striking the real ceilings or being checked by the monetary factor. It is the international changes in the relative prices that make us emphasize this possibility.

It is well known that prices tend to rise before the level of full employment (or full utilization) is reached, on account of incomplete substitutability between resources (inclusive of labour) or of their incomplete mobility. When prices tend to rise more rapidly at home than abroad, as a boom goes on, it does occur, as a matter of course, that demand shifts internationally. First, the rate of growth of exports will drop. It surely means a blow at the boom at home. Secondly, the smaller proportion of the additions to capital equipment will be purchased at home. For businessmen choose to obtain them where they are of lower-price. The same applies to the consumers goods. Thereupon we find the propensity to consume domestic goods become smaller. Another force may help to reduce it. An increase in the share of profits in national income caused by the existence of wage-lags during a boom tends to raise the propensity to save as a whole.

Any of these changes has the effect both to slow down the rate of growth of the effective demand at home and to make the balance of trade more unfavourable. Since we are supposing that the countries in question hold the abundant reserves of international currency, we are justified in disregarding the reaction of the latter to a boom. It is well known that it is not the absolute level of effective demand but its rate of growth that supports a boom. Thereupon it follows that the slowing down of the growth of demand will by itself be sufficient to bring about the collapse of a boom. The real ceilings are not called upon to play any role in the scene. Moreover it is worthy emphasizing that it is of no necessity in our reasoning to assume a weak accelerator. The reason is that such a strong accelerator as Hicks assumed may be so much weakened in its influence on the demand side through the inter-

national changes in prices,<sup>3</sup> just as a weak one in the closed system.

## II

We now turn to the downward process. In this process we can add little to the results accumulated in the past. So I shall give only an outline here.

First of all, we must point out the assymmetry of the acceleration principle. Occurrence of excess capacity due to a decline in production induces the businessmen to contract their capital equipment. A contraction in capital equipment during one period, however, is, unlike its increase, strictly limited by the extent to which wear and obsolescence go during that period. In other words, negative net investment of a firm cannot be more than depreciation of equipment, however large a decline in output may be. Moreover, depreciation is likely to be smaller during a slump than during a prosperity, since inactivity reduces the rate of wear and tear. This prolongs the downswing.

So long as a downswing goes on, the point will be reached, sooner or later, where excess capacity disappears. There exists somewhere the lowest level of capital equipment in correspondence to the lowest level of output regarded as essential for the maintenance of our social life. Once the quantity of equipment should be reduced to this level, the demand for replacement of the worn-out equipment would reappear. It surely means an improvement in the situation from negative to zero net investment. If the acceleration principle should begin to work sensitively again at this juncture, it would be the first and important stepstone to recovery.

To our regret, the mechanics in the real world is not so simple as is often postulated in theory. The 'floor' of a downswing is a much vaguer concept than the 'ceiling.' It is a loose one mainly determined by the past standard of living, and to estimate it definitely seems to be very difficult. This circumstance strengthens the businessmen's

3. This is an instance which is out of Hick's account who distinguishes the booms according to the strength of the accelerator. Cf. J. S. Duesenberry, "Hicks on the Trade Cycle," *Quarterly Journal of Economics*, August 1950, pp. 468-9, and further Hicks' preface to the Japanese edition of his *Trade Cycle*.

pessimism still more who are intimidated by a prolonged depression. Such being the case, there is likely to be little room where the acceleration principle is permitted to work. It may be concluded that stimuli given to the economy are often destined to flicker out in time.

There may, however, exist other roads to recovery. At first, a rescuer may be expected on the monetary side, if the downswing at home is more rapid than abroad. As a result of imports declining more rapidly than exports, there takes place a more favourable balance of trade. It leads to an accumulation of international currency which tends to reduce the rate of interest. It was regarded in the classical theory just as a specific remedy against depression, though it is, in fact, not so effected. For a fall in the rate of interest may affect favourably little upon the investment incentives, on account of the low marginal efficiency of capital during a depression. Thus, we must not count much upon the rate of interest.

Secondly, when prices are falling more rapidly at home than abroad, we may be given a hope through the channel of the international shifts in demand. It may perhaps be difficult to increase exports absolutely, but it will surely be ready to slow down the rate of their decline. Furthermore, there takes place a tendency to substitute the domestic products for imports. This is not all. If the distribution of national income turns to the wage-earners' advantage owing to wage-lags during a downswing, it will raise the propensity to consume as a whole. The increasing unemployed have to be provided for with dissavings of their own or others. All of these operate to increase the effective demand at home, or to check its decline at least, which means a definite advance in the situation. Whether they do answer the purpose of breaking the deadlock depends upon whether they are large and last long in their effects enough to bring the acceleration principle into action. I am doubtful about the possible realization of this condition.

Finally, we have thus far discussed as if replacement investment would be insufficiently undertaken. But it may be contrary to the truth. Individual businesses are often compelled to make innovations one after

another in order to survive in the cut-throat competition during a depression. This is more true in the international market than in the home market. It is usual that a monopolist in the home market is subject to free competition in the international market. Innovations give two kinds of stimuli to the depressed economy. Firstly, autonomous investment for innovations raises the floor, and, when undertaken in large scale, it may alone be able to change the situation. Secondly, innovations are helpful to strengthen the competitive power in the international market and to increase the demand for our products from abroad as well as at home.

In reality, however, an increase in demand for the home products in the foreign market may not be realized so easily as is explained in theory for the following reason. The foreign countries are unlikely to maintain their friendly policies of neutrality in favour of the country in question. Any country is extremely sensitive to his direct interests. Admitting that prosperity in a country would be favourable to others in the long run, any country tends not to leave in the least its own industries to run into difficulties, however temporary. This tendency is more marked during depressions when it is hard to compensate for a disadvantage on the one hand with an advantage on the other. It follows that the foreign countries are more likely to limit their imports for the purpose of protecting their depressed industries than to take some internal measures. If the former is chosen, our hope for recovery through the channel of international trade cannot fail readily to be broken.

In short, It may be concluded that we are yet unable to find any determinate factor contributing to recovery. It is the reason why the exposition of recovery is made markedly more complicated and difficult than that of collapse.

